Hospital such as this could gracefully contribute to the shaping of the policy of lesser practitioners.

The reviewer has occasionally the thankless task of investigating, for the Ministry of Health, maternal deaths in an area belonging to a large local authority. Obvious comparisons have engendered in him two reflections. *First*: How well for maternity were the services of such a Hospital as this everywhere available! *Secondly*: How tragic are the circumstances surrounding some of the cases he has investigated.

On a rough draft of one such report is pencilled, "These investigations would make one sick." No such thoughts need distress the compiler of a report such as we are reviewing. In all modesty, the registrar and his colleagues of the Royal Maternity Hospital may justly claim that they have added to their knowledge and technical skill good faith and good care, and have remained worthy stewards of their great responsibilities.

HEALTH AND POVERTY IN BELFAST

Report by the Ulster Society of Economic Research

M'Gonigle and Kirby[1] have recently shown that, in the normal circumstances of a large proportion of the population of Great Britain, income may be one of the main factors which determines death-rate. Examining, for example, a series of income groups, rising step by step from a group at 25/- to 35/- per family weekly, to a group at 75/- and over per family per week, they found an astonishing difference in death-rates. Mortality in the 25/- to 35/- group was 25.96 per thousand. It fell regularly, as income rose, to 19.23 per thousand in the 45/- to 55/- group. In the group living on 75/- a week or more, the death-rate had fallen to 11.52 per thousand. These results are derived from too small a total sample (3,196 persons) to be regarded as conclusive, and they relate only to the town of Stockton-on-Tees. But the field opened up by these authors is a very significant one; fresh surveys elsewhere may be of the greatest value.

In addition to the main results indicated by this example, a very important principle is demonstrated. It is that causes, which are not to be discovered from a broad average, emerge when a lump is split into proper groups, and handled as a series. It was with the object of confirming or refuting M'Gonigle's results that the work, of which the following is a preliminary account, was undertaken.

The method of approach, which aimed at utilising the statistical resources already available, was based on the assumption that people with equal incomes live in the same or similar districts. Belfast is divided into districts on two systems. For the purposes of registration of births, marriages, and deaths, it is divided into sixteen Dispensary Districts, known by their numbers. For municipal elections, the city is subdivided into fifteen Wards. Such data, as are at present available with regard to the distribution of unemployment, relate to Wards.

The first step was to calculate, for each Dispensary District, certain of the most suitable statistics. The rates selected were :—

1. The infant mortality-rate, taken as the annual number of deaths of infants under one year per thousand live births.
2. The annual number of deaths of children between the ages of 1 and 5 per thousand living children of one year old.
3. The deaths from all types of tuberculosis per thousand of the population in each District.

An annual average was taken from returns, between the first quarter of 1933 and the third quarter of 1936.2 The resulting rates showed a remarkable variability from District to District, amounting, for each rate measured, to a difference of about one hundred per cent. between the lowest and the highest figures. In general, in all three rates, it was the same Districts which had low figures, and the same Districts which had high figures. Figure 1 is a pictorial representation of the results, omitting Districts numbered 7, 8, and 14 (respectively Greencastle, Ligoniel, and Ballymachan), on account of the smallness, or variability, of their population. There is no doubt that these new outlying Districts present some extremely interesting problems, but they cannot be readily dealt with without a more intimate survey. When the new census results are available, it should be possible to examine these Districts more profitably.

The above Dispensary Districts, which are usually known by their numbers, have been named for the convenience of the reader. These names must not be confused with those of the Wards. To the reader who knows Belfast, it is not necessary to stress that the District death-rates in figure 1 correspond fairly well with what he might estimate, from observation, to be the income level in a District. So far it has not been possible to obtain any exact measure of the income level in a Dispensary District.

In the Wards, however, it is possible to make two measurements. The yearly number of *fresh cases* of tuberculosis in each separate Ward is listed in the Medical Officer's report.3 It is also possible to obtain an index of the poverty of the Ward. The numbers of applications, in each Ward, for transitional payments (a kind of unemployment relief) were made available to us by courtesy of the Unemployment Assistance Board. These figures covered the period from October, 1931, to September, 1933. They yielded, therefore, the percentage of the Ward population, who at any time in this two-year period, applied for transitional payments. The spells of unemployment following these applications are not indicated; judging by the highness of the percentages, a considerable number of people must have applied more than once in this period. Most of the applicants will have had one or more persons dependent upon them.

These percentages, therefore, will give a sound index of the proportion of persons with low income in each Ward. It omits, however, a class of persons, even poorer than the above, supported on outdoor relief, of whom one may guess there were about ten thousand in all Belfast at that period.

The above index of very low incomes was then plotted against the number of fresh cases of tuberculosis, per thousand inhabitants in each Ward, for the two years 1932 and 1933. The result is shown in figure 2.

This striking result may be reduced to another form by the following procedure. The Wards are divided into four blocks, according to the percentage of applications for transitional payments, as follows :—

Block I contains the Wards with under 8 per cent. of applications. These are Windsor and Cromac.

Block II contains the Wards with between 8.1 per cent. and 10 per cent. of applications. These are Clifton, St. George's, Woodvale, and Duncairn.

Block III contains the Wards with between 10.1 per cent. and 12 per cent. of applications. These are Ormeau, Dock, Falls, Smithfield, and Shankill.

Block IV contains Wards with over 12 per cent. of applications for transitional payments. These are St. Anne's, Court, Pottinger, and Victoria.

The number of fresh cases of tuberculosis, over the two-year period 1932, 1933, per thousand inhabitants of each of Blocks I-IV was then calculated. The result is set out graphically in figure 3. Since the least number of cases in any one block was 138 out of 51,490 inhabitants (Block III), these results are statistically reliable. The conclusion is that, in Districts where the number of persons of low income, as indicated by the unemployment-rate, is high, the incidence of tuberculosis is correspondingly high, and vice versa. If we are to go further into what particular condition, resulting from being in possession of a low income, causes the high morbidity and mortality, we need not look further, at present, than the factor of food. For the full evidence of this, the reader may be referred to Orr.[4]

The research, of which the above is the first result, has been carried out by a number of private persons, who have formed the Ulster Society for Economic Research, and is published in the name of the secretary. It is hoped, in future reports, to confirm and extend these results.

We wish to express our thanks to the Unemployment Assistance Board, to whom we are indebted for the figures of the local distribution of the unemployed. We also wish to express our thanks to the Vice-Chancellor of Queen's University, and to Professor H. O. Meredith, for their help in this research.

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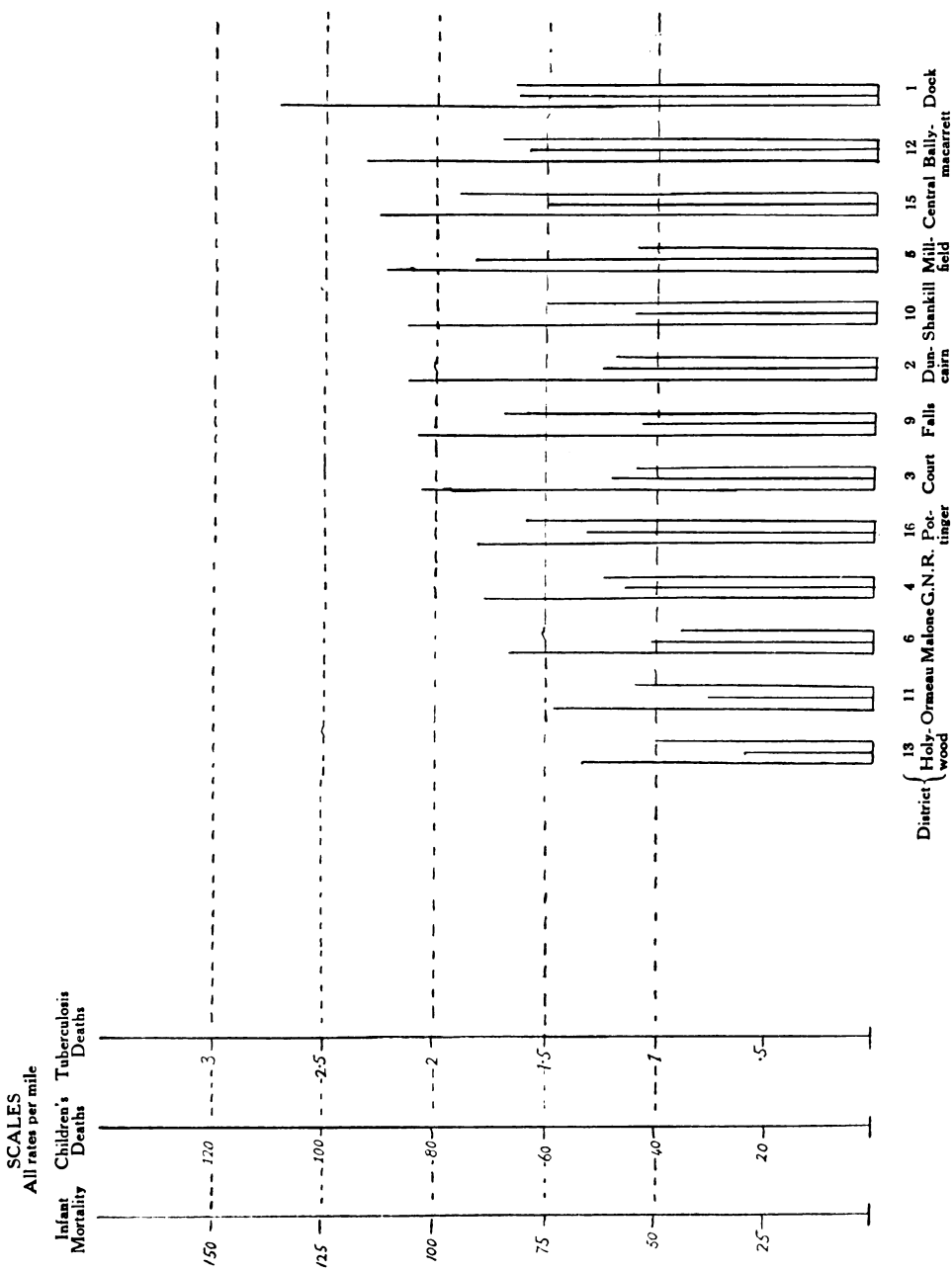

FIG. 1—Certain death-dates in different Districts. The height of the left-hand column indicates the infant mortality-rate. The central column indicates the deaths of children. The right-hand column indicates tuberculosis deaths.

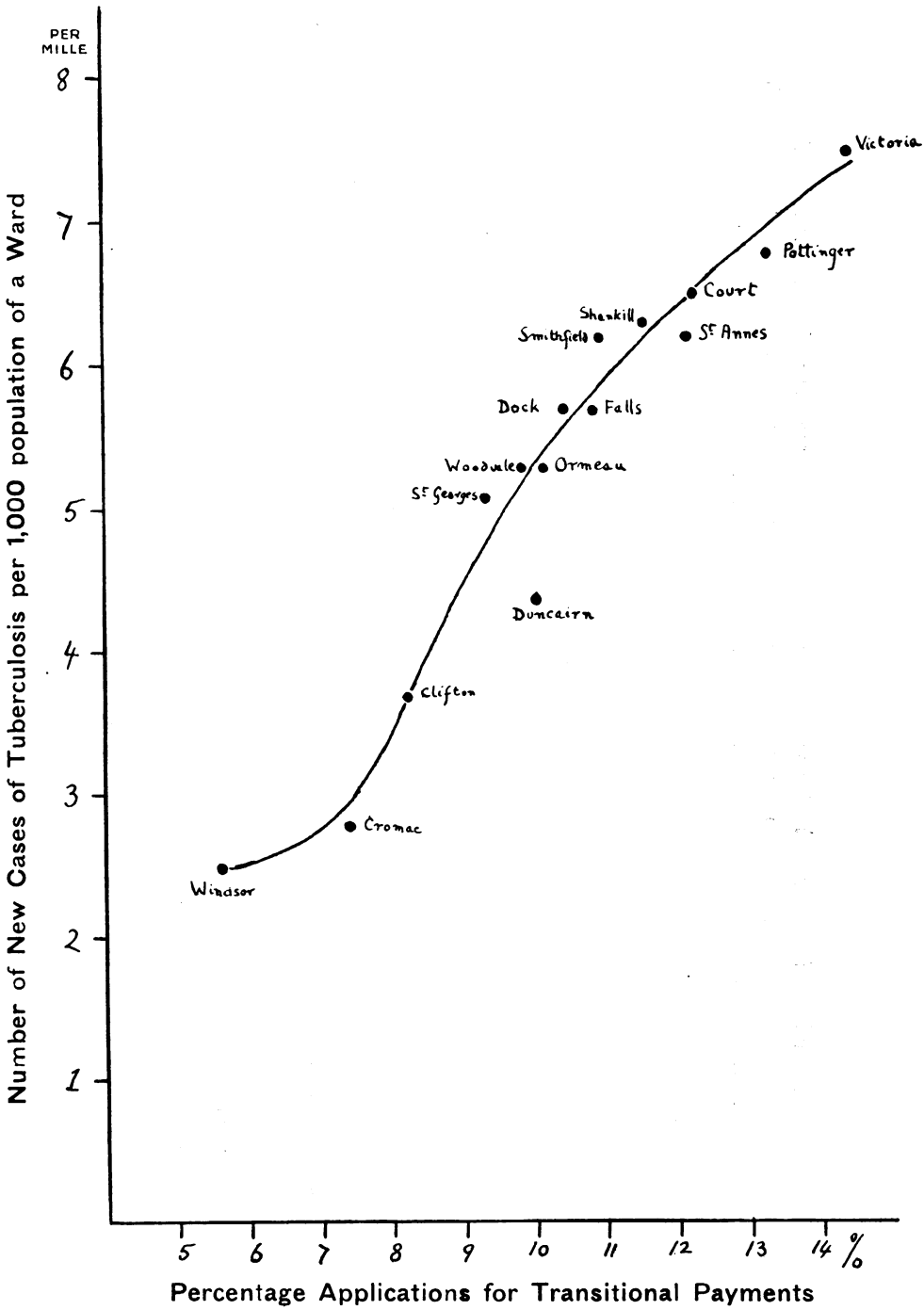
PER MILLE
8
7
6
5
4
3
2
1
Number of New Cases of Tuberculosis per 1,000 population of a Ward
Victoria
Pottinger
Court
Shankill
Smithfield
St Annes
Dock
Falls
Woodvale
Ormeau
St Georges
Duncairn
Clifton
Cromac
Windsor
5
6
7
8
9
10
11
12
13
14 %
Percentage Applications for Transitional Payments

FIG. 2.

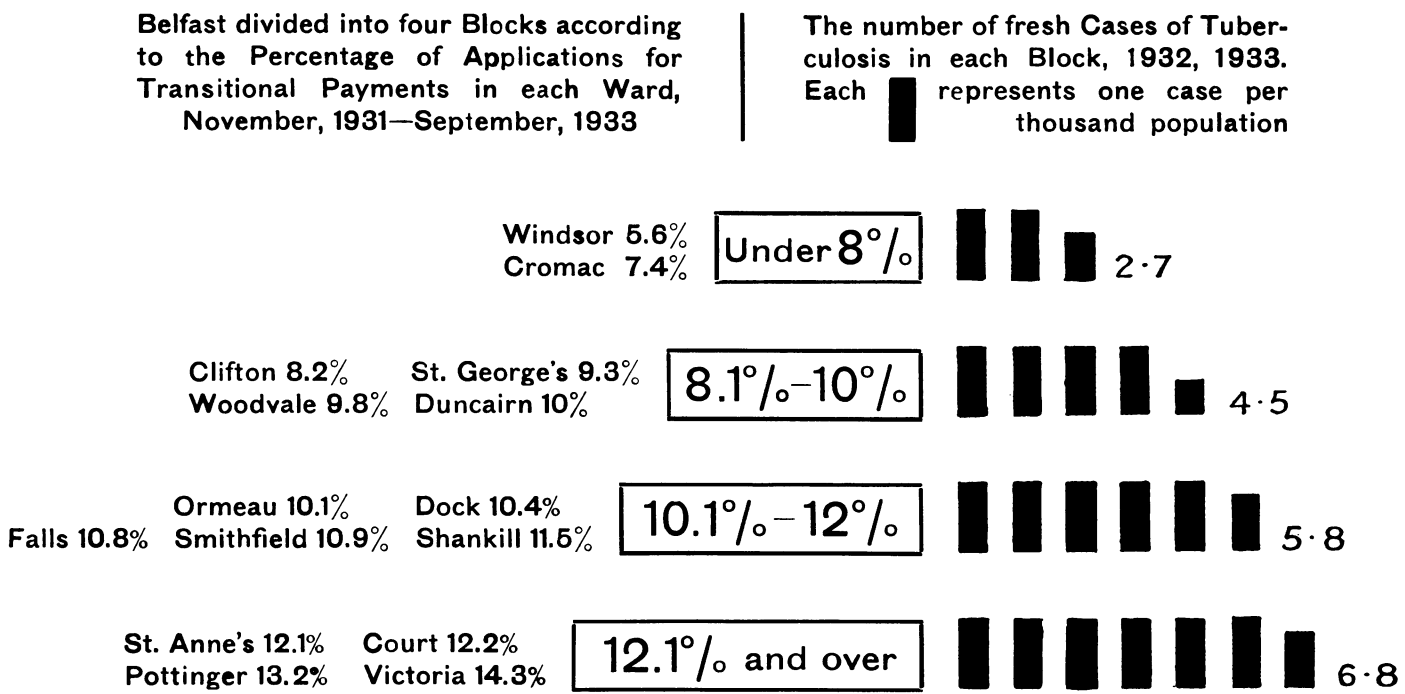

Fig. 3—Unemployment and Tuberculosis.